CRES®
CENTER FOR REPRODUCTION OF ENDANGERED SPECIES

REPORT
WINTER 2001

Understanding Reproductive Success: Southern White Rhino Field Study

Story by Nancy Czekala, Senior Researcher, Endocrinology Division/CRES
Photos by Ron Swaisgood, Ph.D., Giant Panda Conservation/CRES

For 30 years, the Wild Animal Park has been extremely successful in breeding the southern white rhinoceros. In the early 1970s, 22 rhinos were brought to the Park from South Africa, and since then, 89 births have occurred. However, such positive results can lead to a false sense of security for the captive population, because as the offspring (F1 generation) of these wild-born rhinos became mature, it came as a surprise that the captive-born females were not reproducing. These low to zero reproductive rates in this F1 generation were not isolated to the San Diego herd. In fact, in the United States, in the captive population of white rhinos, only 7 percent of the F1 generation have reproduced. This is a serious situation because the original wild-born population imported in the 1970s is now reaching the end of its reproductive life.

Concern about the aging rhino population led the CRES Endocrinology Division, together with the Behavioral Biology Division, to begin a study involving several zoos that would evaluate the reproductive patterns of both normally and subnormally reproducing rhino females. Noninvasive collection of feces samples permitted daily collection of information without disturbing the rhinos and provided details on the reproductive

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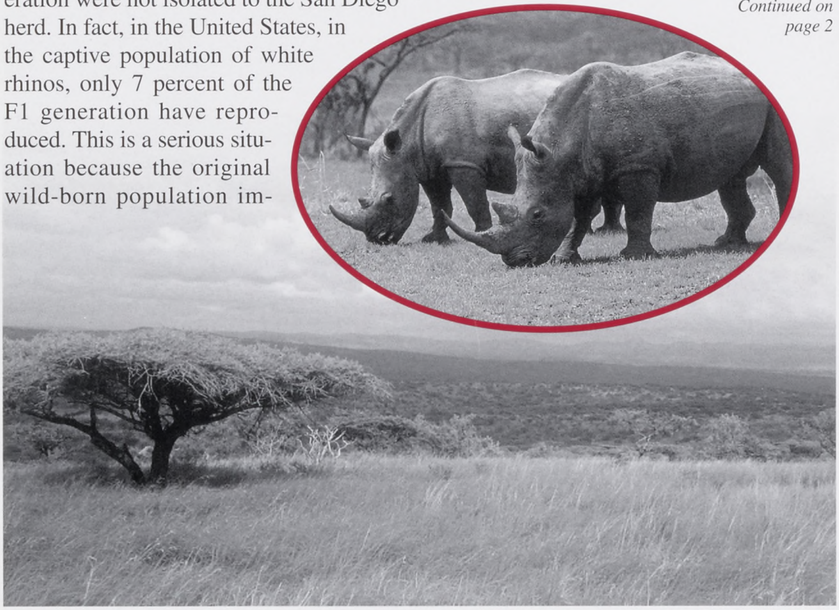

What researchers learn about the behavior and reproductive biology of free-ranging southern white rhinos at the Umfolozi Game Reserve in South Africa may help to improve low birthrates in captive-born rhinos.

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Learning about baby pandas in China
Cub survival at Wolong has nearly doubled!

Panda Discovery Center Opens
See what's new at the remodeled giant panda exhibit! See page 3.

Make Time for Estate Plans
Learn how to help CRES. See page 5.

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Pet owners' purchases support CRES. See back cover.

Understanding Reproductive Success: Southern White Rhino Field Study

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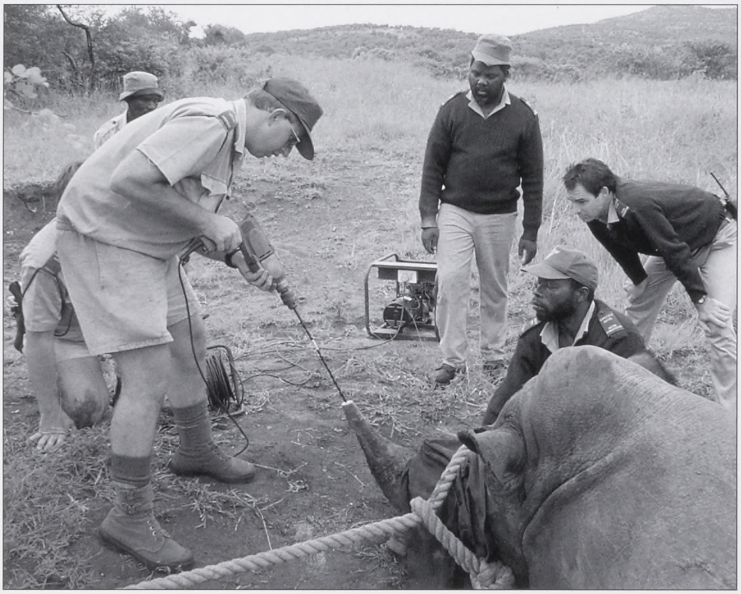
Because rhinos are very wary of people, tracking them in dense bush is both difficult and dangerous.

status of each female. From the fecal progestin data we could determine if a female was ovulating, pregnant, or nonreproductive. These initial studies suggested that some of the rhinos were having infertile cycles, perhaps due to early miscarriage.

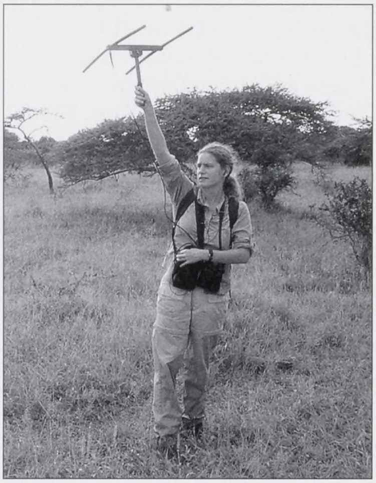
In the reproductive or behavioral study of any species in captivity, it is important to understand the normal biology of their free-ranging counterparts. With the use of hormone analyses from noninvasively collected samples, this is now a possibility. We organized a collaborative project with Professor Norman Owen-Smith from the University of Witwatersrand in South Africa, because he is renowned for his study of the behavior of free-ranging southern white rhinos. Professor Owen-Smith had already established a field study site in the Umfolozi Game Reserve that we were able to join. Funded by several granting organizations, such as the International Rhino Foundation, S.O.S. Rhino, the Amerman Family Foundation, and the Alice C. Tyler Perpetual Trust, we began a project to study the hormonal and behavioral aspects of reproductive biology in wild rhinos.

In our studies with captive rhinos, we had found two types of reproductive cycles, a short one lasting about 35 days and a long one lasting about 70 days.

To be able to find and follow wild rhinos in the bush, we installed radio transmitters in the horns of several female rhinos so that we could track them by radio signals. Females coming into heat were usually accompanied by a dominant bull that attempted to court the female with "hic-pant" vocalizations and tried to rest his chin on her hindquarters. We are currently analyzing the fecal samples in our lab to see if we find the same type of hormone patterns that we found in our captive population. In our studies with captive rhinos, we had found two types of reproductive cycles, a short one lasting about 35 days and a long one lasting about 70 days. The longer cycles appeared to be associated with subfertilities, but we were uncertain which type was really normal. So far, our behavior data from the field point to a normal cycle of about 30 to 35 days for wild rhinos.

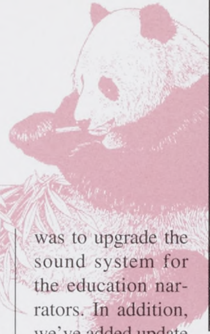


The research team implants small radio transmitters at the base of the horns of several female rhinos so they can be monitored during the breeding season. The radio signal will be emitted for about two years.



CRES researcher Angela White radio tracks white rhinos to collect behavioral data and fecal samples, which are analyzed back at the CRES endocrinology lab.

If this trend holds, then we will have a better understanding of the reproductive problems facing captive rhinos and will be able to apply this information to appropriate management and treatment. These efforts should help prevent the looming crisis in the captive propagation of southern white rhinos, a magnificent species saved from extinction during the last century and one that we hope will begin to breed well in captivity.

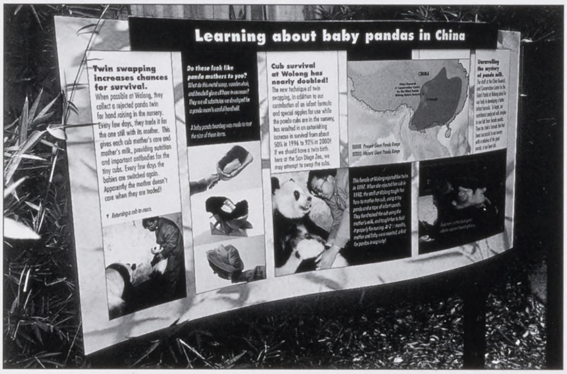


Discover Pandas Again!

A bamboo garden filled with graphic panels and interactive elements is the setting for the San Diego Zoo's outdoor Panda Discovery Center. "Creating understanding and hope for giant pandas" is the overall message for the area. Each graphic panel introduces CRES scientists and Zoo staff, detailing their involvement with panda research projects. In July 2001, the Zoo completed the nine-month renovation of the existing giant panda facility, so that now the expanded Pacific Bell Giant Panda Research Station includes two new viewing areas, the Office of Giant Panda Conservation research building, and the Panda Discovery Center.

One goal for the remodeling project was to improve the guest experience by providing a tiered, more spacious viewing area that reduced the queue line, and another was to upgrade the sound system for the education narrators. In addition, we've added update boards that identify the animals, their vital statistics, viewing hours, and other important information for guests.

Through guest surveys conducted last year, we learned what people already knew about pandas and what they're interested in. The Panda Discovery Center gives guests an in-depth look at what is happening behind the scenes at pandas. A crawl-in, life-size den appeals to kids, while the accompanying graphic panel explains how pandas use dens in the wild and tells about an ongoing CRES den study in China. CRES' analytical chemistry lab has synthesized our male panda's scent mark, which guests can smell as part of the sign that explains scent marking. A video unit shows our work with pandas, including nutrition and genetics. Other topics covered include enrichment, behavior research, and nursery improvements, all directly related to CRES projects. An adjoining outdoor classroom will allow us to present in-depth panda school programs and perhaps even Internet videoconferencing.


Learning about baby pandas in China
Twin swapping increases chances for survival.
Do these look like panda mothers to you?
Cub survival at Wolong has nearly doubled!
Unraveling the mystery of panda milk.
CHINA

The renovation has expanded the animal quarters. The new facilities were designed to assist our keepers in continuing to provide excellent care. A state-of-the-art nursery facility was built to allow us to hand rear a cub, should we ever have that need again. In addition, new hillside enclosures are planned to allow climbing and provide additional exercise areas off exhibit. A sophisticated video monitoring system was installed to allow our researchers to collect data on the pandas in more efficient ways, while the research building allows the panda team to work in proximity to each other and the animals themselves.

The Zoological Society is grateful to the many donors who supported this project, including a gift from the Lois Jean Fellman Schmutz Trust. With many Zoo visitors enjoying the center daily, and the pandas thriving in their new exhibit, this project is a success from every aspect.

–Stephanie Weaver,
Education Specialist/Zoo

CRES Grants

The Center for Reproduction of Endangered Species is grateful to the following generous donors for their support of imperiled wildlife.

An **Anonymous** foundation gave a generous grant for a biological monitoring study at the Wild Animal Park. The **Biotechnology Industry Organization (BIO)** gave a donation that will be used to purchase a truck for a rhinoceros field study in Africa. **The Morris Animal Foundation** awarded a grant for a gorilla endocrinology study, and a grant from the **Campbell Family Foundation** will help to fund an elephant endocrinology study. **The Annie Sinclair Knudsen Fund of the Hawaii Community Foundation** gave a grant for endangered Hawaiian bird conservation. **The San Diego Foundation/Don and Marie Van Ness Fund** provided funding for a CRES internship, and the **Sahan Daywi Foundation** provided needed CRES equipment items. **The Eddy Foundation** and the **San Diego Chinese Women's Association** gave to the seed banking program at the Wild Animal Park's Botanical Conservation Center.

Our 2001 Bonner and Weedon College Student Research Fellows

Since 1994, a number of promising young scientists have benefited from the Bonner Summer College Student Fellowship Endowment Fund. Jewell H. and James T. Bonner established this fund to sponsor summer interns working on various research projects at CRES that are dedicated to the preservation of wildlife. This year, Robert H. Weedon established the JoAnn B. Weedon CRES Educational Fund, in memory of his late wife, which also sponsors young university students with an interest in conservation and research. In 2001, CRES welcomed four Bonner Fellows and two Weedon Fellows, with four projects outlined below. You can be part of these generous endeavors by helping to sponsor one of our CRES summer student fellows. For more information, please call Amy Parrott in the Development Department at (619) 685-3213.

Joseph LaMonte, from Cornell University, spent the summer as a Bonner Fellow with the CRES Analytical Chemistry Division. As a chemistry major, Joe was familiar with many of the techniques and methods being used in the laboratory and was a great asset. Most of his time was spent running and analyzing samples using our larger instruments. His personal favorite was the room-sized nano-electrospray, an instrument currently set up to convert microdrops of urine into a fine mist, which is useful to detect and measure reproductive hormones. In August, Joe analyzed urine on a daily basis from Bai Yun, our female giant panda, in an attempt to determine if she was pregnant; but unlike two years ago, this year there was no baby panda. A big fan of carnivores, Joe also looked at samples from potentially pregnant sun bears and the female spectacled bear.

During Joe's stay, analysis was begun to determine the chemical composition of the odor produced by owl monkey scent glands. Different odors and the production of scent marks (concentrations of scent rubbed onto environmental objects) play important roles in communication between individuals of this species. Using our gas chromatograph-mass spectrometer—an instrument that separates and identifies the different molecules that make up the gaslike odor—he was able to see that adult males, females, and young monkeys all produce individual and characteristic scents. As our database of mass spectra odor profiles (like those collected by Joe) grows larger, our goal is to identify individual owl monkeys, including their family lineage and relatedness, through scent marks left behind on trees and rocks.

–Lee Hagey, Ph.D., Head, Analytical Chemistry Division/CRES

Another Bonner Fellow, Julia Riemann, interned with the CRES Ecology and Applied Conservation Division. A student at the University of Illinois, Champagne-Urbana, Julia jumped into summer work at the newly completed Seed Bank at the Wild Animal Park. She provided outstanding support for our plant conservation effort there, initiating several important tasks on her own.

Having a real appreciation for North American native plant communities, as well as a concern about the loss of tall prairie grass habitat in Illinois, Julia was excited to learn about our conservation of imperiled plant communities here in Southern California. She quickly became acquainted with the Wild Animal Park's native species preserve and began plant surveys at selected locations throughout the area. Taking photos, running transects, collecting and keying out native and non-native species, Julia provided us with vital information about the plants of our backcountry and their location.

Now that summer has ended and Julia is back at the university, the information she collected during her fellowship is being used to guide us to the plants that provide the seeds for storage in our Seed Bank. Samples from these fast-disappearing plant communities will now be available for scientific study, propagation, and reestablishment, thus ensuring that they continue to support so many threatened and endangered animal species. Julia was grateful for the opportunity to work with CRES staff, and the internship exceeded her high expectations. As her supervisor observed, "She exceeded ours as well, and we know she'll continue to contribute greatly to the conservation of nature."

–Jeff Opdycke, Conservation Program Specialist, Ecology and Applied Conservation Division/CRES

This summer, the JoAnn B. Weedon CRES Educational Fund supported two university students, Jessica Hartley and Leslie Platz, in the Behavioral Biology Division. Both students participated in behavioral data collection from time-lapsed videotape recordings on research projects involving endangered birds. Their training consisted of learning how to collect quantifiable behavioral data utilizing an all-occurrence scoring system of both event and durational behaviors. In addition, the students were responsible for all data summaries and entries into the computer, utilizing statistical and software programs for preliminary analyses. Finally, both students were asked to write a brief report in scientific format describing their objectives, methods, and results of their summer project.

Jessica Hartley assisted in data collection on male and female behavior during the breeding season of the 'alala, or Hawaiian crow. For one pair of Hawaiian crows, she investigated sex differences and behavioral interactions between the mated pair around the nest area. Her results show that the male exhibited high rates of solo play and stereotypy around the nest. In addition, the male had high rates of trying to nudge the female out of the nest. These behaviors by the male resulted in high levels of contact aggression by the female that were directed toward the male. Results from Jessica's work suggest that in the future, the male in this pair of birds would not be a suitable candidate for rearing his own chick.

Leslie Platz was chosen to assist in data collection on parental care behavior during chick rearing in California

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Girl Scouts Recycle for CRES!

We salute the Girl Scouts who participated in the Fourth Annual Girl Scout Cans for Critters Drive. More than 200 troops joined the recycling drive and collectively recycled more than 16,500 pounds of aluminum equal to 515,000 CANS! More than 2,000 patches were awarded to those Girl Scouts who collected 200 or more cans. Participants were thanked and top collectors honored at the Girl Scout Jamboree on November 10, 2001. A special sea lion show was held for Girl Scouts at the Zoo to thank them for their participation in the program and to recognize their hard work. The top collectors of the drive were Alisa Miller with 6,555 cans, Kayla Vanaselja with 6,458 cans, and Kristi Pinterich with 5,000 cans, while the top collecting troop was #6739 with a total of 12,300 cans. The proceeds from the recycling were donated to CRES. If your troop, school, or organization would like to be a part of the Cans for Critters recycling program, please call Tamara Langmead at (760) 796-5664.

Georgeanne Irvine

Members of Brownie Troop 6739 were honored with goodie bags and an up-close encounter with Nelson the California sea lion for being the top collecting troop of the Fourth Annual Girl Scout Cans for Critters Drive. Their troop collected more than 12,300 cans, which translates into about $384 for CRES.

Planning for the Future

If you would like to join CRES in the fight against extinction and include yourself among a generous group of supporters who have provided financial assistance to CRES, consider making a planned gift. These come in many forms and can be designed to provide you with income for life, immediate tax deductions, a reduction in your estate tax liability, and avoidance of capital gains taxation. Plus, it is rewarding to know that you are leaving an enduring legacy for generations to come.

Some of the most common planned gift devices are bequests in wills and trusts, life income fund contributions, Charitable Remainder Trusts, donations of life insurance policies, and life estate arrangements. Planned gifts provide important future capital for CRES programs that are leading the way in wildlife conservation research, while often allowing you to maintain the use of your cash and assets during your lifetime. For instance, by naming the Zoological Society's CRES as a beneficiary of a bequest in your will or trust, you make a future gift with no immediate cash out of pocket. And, of course, outright gifts of cash and appreciated securities are always welcome and sincerely appreciated!

For more information on how you can help CRES continue its important work, please contact Patrick O'Reiley at (619) 685-3215, P.O. Box 120551, San Diego, CA 92112. If you have already included us in your estate plan, we want to know! Please phone or write to us so that we may properly thank you and include you as a member of our prestigious Heritage Guild.

Our 2001 Bonner and Weedon College Student Research Fellows

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condors. Leslie had the opportunity to make comparisons between two pairs of birds, each with two different chicks during the first 90 days posthatch. No consistent sex differences were found across the pairs in the brooding or feeding rates of chicks. For example, the female in one pair was the consistent feeder of chicks, while the male in the other pair was the primary chick feeder. Males in both pairs fed their second chick more than they did their first chick. The number of days that aggression occurred in the nest box for one pair did decrease from the 1995 to the 2000 breeding season. No difference was found in the number of days when aggression occurred, from one chick to the next chick, for the second pair of birds. Leslie's preliminary results indicate that the frequency of some behaviors, as well as behavioral interactions between the sexes, can change dramatically from one season to the next.

The data the JoAnn B. Weedon CRES Educational Fund students collected this summer have now become part of a larger, ongoing database, which when completed will be published in scientific journals. Both students will be acknowledged for their valuable contribution to the behavioral programs.

–Nancy Harvey, Ph.D., Research Associate, Behavioral Biology Division/CRES

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Dr. Alan Dixson, Director of Conservation and Science for the Zoological Society, and a furry friend accept this year's cause marketing contribution from Glenn Williams, Director of National Accounts for The Iams Company, and Bill Lechtner, Vice President, General Merchandising Manager for PETCO Animal Supplies, Inc.

For the second year, PETCO Animal Supplies, Inc. and The Iams Company have joined forces to support CRES. In August, PETCO stores throughout the country offered consumers the opportunity to support our worldwide conservation efforts through purchases of Eukanuba dog and cat food. Iams donated 50 cents to CRES from bags purchased at PETCO, culminating in a gift of $30,000.

Our partnership with PETCO and The Iams Company has provided more than $50,000 to date for conservation and research at CRES, and it has also generated awareness throughout the country about the importance of saving endangered species. We appreciate the support of corporations such as PETCO and The Iams Company, which allow us to increase our conservation efforts in the field as well as at our facilities. In working together, we are more certain to reach our worldwide conservation goals.

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C·R·E·S REPORT

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